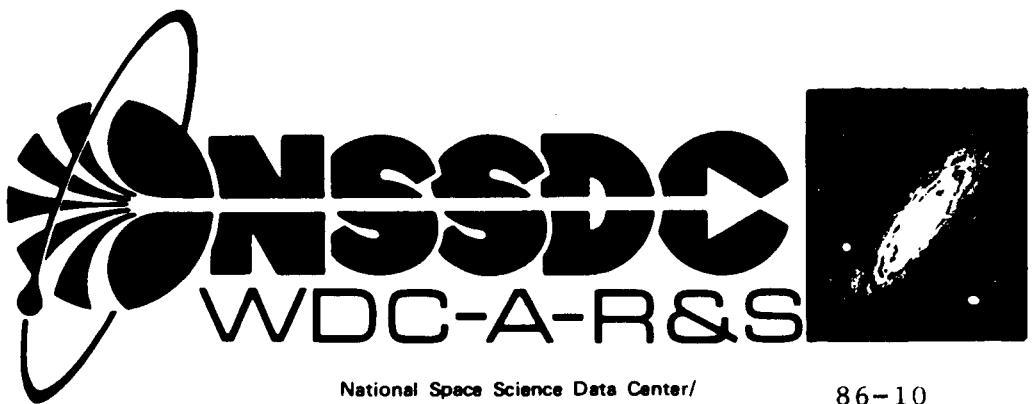


NASA-TM-89688



National Space Science Data Center/  
World Data Center A For Rockets and Satellites

86-10

(NASA-TM-89688) DOCUMENTATION FOR THE  
MACHINE-READABLE VERSION OF A DEEP  
OBJECTIVE-PRISM SURVEY FOR LARGE MAGELLANIC  
CLOUD MEMBERS (NASA) 18 P

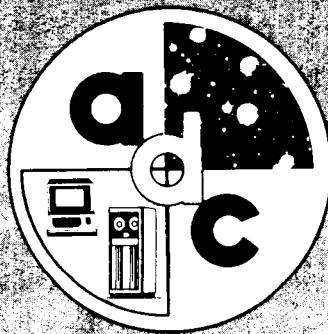
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DOCUMENTATION FOR THE MACHINE-READABLE VERSION  
OF THE  
A DEEP OBJECTIVE-PRISM SURVEY FOR LARGE MAGELLANIC CLOUD MEMBERS

15 AUGUST 1989

NASA-TM-89688



DOCUMENTATION FOR THE MACHINE-READABLE VERSION

OF

*A DEEP OBJECTIVE-PRISM SURVEY FOR LARGE MAGELLANIC CLOUD MEMBERS*

(SANDULEAK 1969)

MACHINE VERSION 1987

Wayne H. Warren Jr.

May 1987

National Space Science Data Center (NSSDC)/  
World Data Center A for Rockets and Satellites (WDC-A-R&S)  
National Aeronautics and Space Administration  
Goddard Space Flight Center  
Greenbelt, Maryland 20771

DOCUMENTATION FOR THE MACHINE-READABLE VERSION

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ABSTRACT

The machine-readable version of the catalog, as it is currently being distributed from the Astronomical Data Center, is described. The catalog is a compilation of 1273 probable or proven members of the Large Magellanic Cloud, as found and measured on objective-prism plates. In addition to measured positions, the catalog contains cross identifications to other catalogs, OP spectral types, estimated photographic magnitudes, and finding-chart identifications. The present version contains updates and corrections that have been incorporated since to the publication of the original catalog and the issuance of the previous machine edition.

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## SECTION 1 - INTRODUCTION

This catalog contains 1273 proven or probable Large Magellanic Cloud (LMC) members, as found on deep objective-prism plates taken with the Curtis Schmidt telescope at Cerro Tololo Inter-American Observatory in Chile. The stars are generally brighter than about photographic magnitude 14 and are identified on charts published by Hodge and Wright (1967) and reproduced in the source publication (Sanduleak 1969). Approximate spectral types were determined by examination of the  $580 \text{ \AA mm}^{-1}$  (at  $H_{\gamma}$ ) objective-prism spectra; approximate 1975 positions were obtained by measuring relative to the 1975 coordinate grids on the Uppsala-Mount Stromlo Atlas of the LMC (Gascoigne and Westerlund 1961), and approximate photographic magnitudes were determined by averaging image density measures from the plates and image-diameter measures on the "B" charts of Hodge and Wright (1967).

This document describes the machine-readable version of the LMC survey catalog as it is currently being distributed from the Astronomical Data Center (ADC). It is intended to enable users to read and process the data without problems and guesswork. For additional details concerning the observations and measurements, the source reference should be consulted. A copy of this document should be transmitted to any recipient of the machine-readable catalog originating from the ADC.

### SOURCE REFERENCE

Sanduleak, N. 1969, *A deep objective-prism survey for Large Magellanic Cloud members*, Cerro Tololo Inter-American Observatory, Contrib. No. 89.

## SECTION 2 - TAPE CONTENTS

A byte-to-byte description of the contents of the machine-readable catalog is given in Table 1. The suggested format can be modified depending upon usage, although data fields specified with A (character) formats only contain character data and substitute specifications cannot be used. Alternate specifications are given in parentheses.

Table 1. Tape Contents. A deep objective-prism survey for LMC members .

Byte(s)	Units	Suggested Format	Description
1- 7	---	A7 (I3,I4)	Catalog number (NS): Declination zone in bytes 1-3 (sign always in byte 1), number in bytes 5-7 (byte 4 always blank).
8	---	A1	Suffix character "a", "b", or "c" in cases where more than one star has the same NS number. Blank otherwise.
9	---	A1	Asterisk if there is a note about this star in the published catalog. The notes are reproduced in Table 3 of this document.
10-15	---	I6 (A6)	Number in the <i>Henry Draper Catalogue</i> (HD); otherwise blank.
16	---	A1	Colon (:) if HD identification uncertain; otherwise blank.
17-23	---	A7 (I4,I3)	Number in the <i>Cape Photographic Durchmusterung</i> (CPD); blank for no CPD identification.
24	---	A1 (1X)	Reserved for CPD colon (:), but no cases occur in the catalog.
25-26	hours	I2	Right ascension $\alpha$ 1975.
27	---	1X	Blank
28-31	min	F4.1	$\alpha$
32	---	1X	Blank
33-35	$^{\circ}$	I3	Declination $\delta$ 1975. Sign always in byte 33 (always negative).
36	---	1X	Blank

Table 1 (concluded)

Byte(s)	Units	Suggested Format	Description
37-38	'	I2	δ
39-44	---	A6	Spectral type (OP). Lower case characters are used for broad lines (n) and emission (e) symbols.
45-48	mag	F4.1	Photographic magnitude $m_{pg}$ (always present).
49	---	A1	"v" if variable $m_{pg}$ ; otherwise blank.
50-61	---	A12 (3A4)	or equivalent. Finding chart identification in source publication (Sanduleak 1969). When a star is identified on more than one chart, the numbers are separated by commas. (Identifications such as 45a, 45d are present).
62-92	---	A31 (7A4,A3)	Alternate identification designations for the star, separated by commas for multiple entries. Abbreviations for the numbers are given in Table 2 of this document. Otherwise blank.

Table 2. Key to Alternate Identifications.

Des.	Reference	Information Content
AL	Andrews and Lindsay (1964)	List of H <sub>α</sub> emission stars
BBB	Bok, Bok and Basinski (1962)	Color-magnitude arrays for two associations
FDD	Fehrenbach, Duflot and Duflot (1965)	List of stars having very large radial velocities indicating LMC membership
HV	Hodge and Wright (1967)	List of Harvard variables
L	Lindsay (1963)	List of H <sub>α</sub> emission stars
MWC	Merrill and Burwell (1933, 1943, 1949)	Mount Wilson catalog and bibliography of stars of classes B and A whose spectra display bright hydrogen lines
R	Feast, Thackeray and Wesselink (1960)	Spectroscopic and photometric data for known bright LMC members
S	Henize (1956)	List of H <sub>α</sub> emission stars
W	Westerlund (1961)	Photometric data in several selected regions of the LMC. As an example of the notation, W10-46 means star 46 in Westerlund's table 10
Wo	Woolley (1968)	Proper motions for stars in a one square degree region
WS	Westerlund and Smith (1964)	A list of Wolf-Rayet stars

**Table 3. Notes to Catalog Data Records.**

Zone	Star	Remarks
-65°	20a	Easternmost star of unresolved pair on the chart.
	62	Westernmost of the three stars.
-66°	41	Brightest star in NGC 1769. See Woolley (1963) for positive identification.
	43	Easternmost of two brightest stars in NGC 1773.
-67°	97	Westernmost of unresolved pair on the chart. No. 98 is the other star.
	19	Strong Balmer discontinuity.
-68°	44	Very strong Balmer discontinuity.
	250	Excites large H II ring.
-69°	15	Westernmost star of unresolved pair on chart.
	18	Double. Both components are OB stars.
-70°	19	Located just south of a much brighter late-type star.
	93	Strong Balmer discontinuity.
-71°	98	See chart by Westerlund (1961) for positive identification.
	100	K-line present.
-72°	110	Should be deleted. Proven foreground star.
	145	Shows $\lambda\lambda$ 3811-34 (OVI) in emission.
-73°	25	Excites H II region.
	36a	Double. Both components are OB stars.
-74°	76	South-trailing star.
	94	North-preceding star.
-75°	147a	North-preceding star.
	148	May be late-type supergiant.
-76°	209a	See chart by Westerlund and Smith (1964) for positive identification.

**Table 3 (concluded)**

Zone	Star	Remarks
-69°	223	South-preceding star whose spectrum overlaps with that of star 224 to form HD 38029.
	243	See Feast <i>et al.</i> (1960) for positive identification of this star and several WR stars which we could not detect because of the nebulosity in this region.
	266	North-trailing star.
-70°	98	Brightest star in the cluster SL539 = HDE 269664.

### SECTION 3 - TAPE CHARACTERISTICS

The information contained in Table 4 is sufficient for a user to read the machine version of the catalog. Statistics for the entire catalog are given in the table, but data which are easily varied from installation to installation, such as block size (physical record length), blocking factor (number of logical records per physical record), total number of blocks, tape density, and coding (EBCDIC, ASCII, BCD, etc.) are not included: these parameters should always be supplied if secondary tape copies of the catalog are transmitted to other users or installations.

Table 4. Tape Characteristics. A deep objective-prism survey for Large Magellanic Cloud members.

NUMBER OF FILES .....	1
LOGICAL RECORD LENGTH (BYTES) .....	92
RECORD FORMAT .....	FB*
TOTAL NUMBER OF LOGICAL RECORDS .....	1273

\* Fixed length blocks (physical records). Last block may be short.

#### SECTION 4 - REMARKS AND REFERENCES

The data, contained in Table III of Sanduleak (1969), were transcribed to data forms at the Astronomical Data Center, then punched to cards and verified at two separate locations. The resulting two card decks were transferred to disk and compared, corrected, and modified with the addition of the notes flags and extension to 85-byte records. This first machine version of the catalog was documented by Warren (1982).

A letter and photocopy of the original paper were received from Dr. Esther M. Hu of the University of Hawaii in August 1986. The photocopy had been made from a reprint supplied to the Space Telescope Science Institute by Dr. Sanduleak in 1985, in which he had made a number of additions, deletions and corrections by hand, and these had been highlighted by Dr. Hu. The catalog was dearchived and the changes were incorporated; these changes are listed in Table 5. Additional cross identifications to previously cataloged objects required an extension of the logical record length to the current 92 bytes. A listing of the updated catalog was then sent to Dr. Sanduleak, who made additional changes and returned the listing. These changes were then incorporated into the catalog and added to Table 5.

**Table 5. Changes Made to the Catalog in 1985 and Incorporated into the Machine Version.**

NS	Datum	For	Read	Remarks
-65 7a	Des		S10,Wo71,AL-47	
	SpT	OB:	OB:(e)	
-66 22	Des	S4,AL-31		Delete
-66 58	DM		-66 372	
-66 84	HDE		271234	
-66 96	Des	AL-196:		Delete
-66 103	Des	AL-208:		Delete
-66 104	HDE		271291	
-66 132	DM		-66 429	
-67 1	Des	AL-17:	AL-17	
-67 36	DM		-67 381	
-67 37a	Des		AL-55	Add
-67 64	Des		MWC105	Add
-67 114	Des	AL-195:		Delete
-67 158	Des	AL-271:		Delete
-67 165	Des	AL-278:	AL-278	
-67 167	SpT	OB	uf	
-67 175	HDE		269721	
-67 177	HDE	269724		Delete
-67 179	Des		AL-301	Add

Table 5 (continued)

NS	Datum	For	Read	Remarks
-68 40	DM		-68 312	
-68 42	SpT	OB	OB(e)	
-68 48	SpT	B6I	B6I(e)	
-68 51	SpT	OB:	OB:(e)	
-68 52	DM		-68 318	
-68 63	DM		-68 326	
-68 115	Des	AL-289:	AL-289	
-68 135	DM		-68 406	
-68 138	HDE	269928		Delete
-68 143	Des		FDD	Add
-69 2a	HDE		268612	
-69 6	HDE		268632	
-69 77	Des		MWC106	Add
-69 78	DM		-69 344	
-69 79	Des		MWC492	Add
-69 89	DM		-69 351	
-69 91	DM		-69 353	
-69 92	DM		-69 352	
-69 93	DM		-69 354	
-69 94	Des		MWC108	Add
-69 94	DM		-69 356	
-69 100	DM		-69 360	
-69 102	HDE	269357		Delete
-69 104	HDE		269357	
-69 113	DM		-69 367	
-69 121	Des	L-216:		Delete
-69 129	Des		FDD	Add
-69 142a	Des		MWC112	Add
-69 147a	Des		MWC113	Add
-69 160	Des	L-265:	L-263	
-69 172	Des	AL-260:		Delete
-69 200	DM		-69 399	
-69 201	Des		MWC121	Add
	DM		-69 401	
-69 202	Des		Supernova 1987a?	
-69 202	DM		-69 404	
-69 205	Des	L-294:	L-294	
-69 209	Des		L-296	Add
-69 216	Des		MWC123	Add
-69 220	Des		MWC511	Add

Table 5 (concluded)

NS	Datum	For	Read	Remarks
-69 223	DM		-69 429	
-69 234	HDE	269891	269888	
	DM	-69 442		Delete
-69 245	Des		AL-380	Add
-69 258	DM		-69 479	
-69 259	Des		MWC126	Add
	DM		-69 478	
-69 261	Des	L-312:		Delete
-69 262	Des		W-8-12	Add
-69 263	DM		-69 488	
-69 264	DM		-69 490	
-69 273	DM		-69 502	
-69 276	DM		-69 504	
-69 290	DM		-69 513	
-70 29	Des		MWC97	Add
-70 30a	Des		S152	Add
-70 92	Des	L-241:	L-241	
-70 98	HDE		269664	
-70 109	Des		S168	Add
-70 111	HDE	269992	269993	
-70 111	DM	-69 503	-70 435	
-71 23	DM		-71 336	
-71 33	Des		S167,L-254	Add
-71 34	Des	L-264:	L-264	
-71 35	Des	L-270:	L-270	
-71 50	Des	L-317:	L-317	

ACKNOWLEDGMENTS

Appreciation is expressed to Dr. Esther M. Hu for supplying the annotated copy of the published catalog containing the corrections and cross-identification updates. Dr. N. Sanduleak kindly supplied additional changes and reviewed a draft copy of the latest version of this document.

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## SECTION 5 - SAMPLE LISTING

The sample listing given on the following pages contains logical data records exactly as they are recorded on the tape. Groups of records from the beginning and end of the file are illustrated. The beginning of each record and the bytes within the record are indicated by the column heading index across the top of each page (digits read vertically).

## LISTING OF RECORDS FROM TAPE FILE

C O L U M N H E A D I N G		T A P E   F I L E   N A M E :   L M C   S u r v e y			
		R E C O R D S	1   T O   2 0		
		T A P E   F I L E	5 8		
		R E C O R D   L E N G T H	9 2   B Y T E S		
		I N P U T   V O L S E R	A D C 0 0 3		
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
2	3	4	5	6	7
8	9	10	11	12	13
14	15	16	17	18	19
20	21	22	23	24	25
26	27	28	29	30	31
32	33	34	35	36	37
38	39	40	41	42	43
44	45	46	47	48	49
50	51	52	53	54	55
56	57	58	59	60	61
62	63	64	65	66	67
68	69	70	71	72	73
74	75	76	77	78	79
80	81	82	83	84	85
86	87	88	89	90	91
92	93	94	95	96	97
98	99	100	101	102	103
104	105	106	107	108	109
110	111	112	113	114	115
116	117	118	119	120	121
122	123	124	125	126	127
128	129	130	131	132	133
134	135	136	137	138	139
140	141	142	143	144	145
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578	579	580	581	582	583
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596	597	598	599	600	601
602	603	604	605	606	607
608	609	610	611	612	613
614	615	616	617	618	619
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799	800	801	802	803	804
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807	808	809	800	801	802
803	804	805	806	807	808
809	800	801	802	803	804
805	806	807	808	809	800
801	802	803	804	805	806
807	808	809	800	801	802
803	804	805	806	807	

L I S T I N G O F R E C O R D S F R O M T A P E F I L E